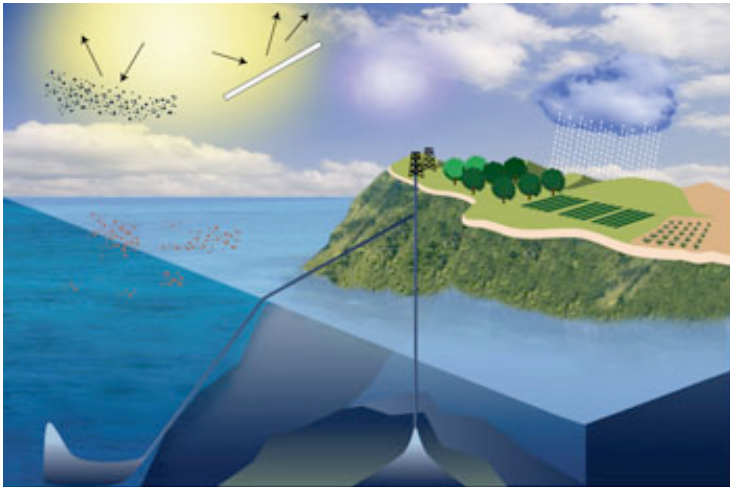


LAWRENCE LIVERMORE REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory: May 26-June 2, 2008.

Geoengineering could slow down the global water cycle



A schematic representation of various geoengineering and carbon storage proposals.

As fossil fuel emissions continue to climb, finding ways to reduce the amount of sunlight hitting the Earth could have a cooling effect on surface temperatures.

However, a new study from Lawrence Livermore National Laboratory, led by atmospheric scientist Govindasamy Bala, shows that this intentional manipulation of solar radiation could lead to a less intense global water cycle. Decreasing surface temperatures through "geoengineering" also could mean less rainfall.

In a new climate modeling study, which appears in the May 27-30 online edition of the *Proceedings of the National Academy of Sciences*, Bala and colleagues Karl Taylor and Philip Duffy demonstrate how geoengineering could lead to a decline in the intensity of the water cycle.

For more, see https://publicaffairs.llnl.gov/news/news_releases/2008/NR-08-05-04.html

Teller, a world-renowned physicist, co-founder of Lawrence Livermore National Laboratory, and lifelong advocate for education, died in 2003 at the age of 95.

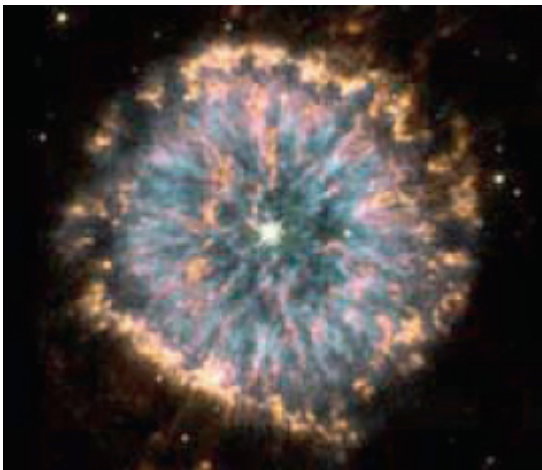
All of the speakers had a connection to Teller, some personal and others through their field of research.

In his welcoming address, Lab Director George Miller observed that Teller "had an enormous impact on physics in the 20th century and was an inspiration to countless researchers at the Laboratory and elsewhere.

"Those of us who were privileged to work with him gained from his vast knowledge, his creativity and insights and his enthusiasm for scientific discovery and its application," Miller said. "He had an amazing way of always getting to the heart of a matter."

For more on the symposium, including a video on Teller's life, see https://newsline.llnl.gov/articles/2008/may/05.30.08_teller.php

Stellar serendipity and the carbon conundrum



During their evolution, low-mass stars enrich the interstellar medium with elements, creating a planetary nebula such as the one shown here. (Image courtesy of the Space Telescope Science Institute.)

Using a three-dimensional model run on some of the fastest computers in the world, Lawrence Livermore astrophysicists have cracked a mystery of stellar evolution that has puzzled the astronomical community for nearly four decades. For years, physicists and astronomers theorized that low-mass stars (one to two times the mass of our sun) produce great amounts of



Technicians installing a transport mirror on NIF's 5,000th LRU

Two significant project milestones for the National Ignition Facility (NIF) were reached last week. NIF is Lawrence Livermore's 192-beam laser that will be used to conduct fusion experimentation starting in 2010. Earlier this week, the 5,000th production line replaceable unit (LRU) was installed. LRUs are modules that contain laser optics or mechanical units necessary for NIF operation. LRU installation is now more than 80 percent complete, with approximately 1,200 LRUs remaining.

Also, the 48th integrated optics module (IOM) was installed, marking the completion of installation of the first bundle of 48 beams on the target chamber. The overall project is now 97 percent complete, with the capability of delivering up to 3.42 megajoules of infrared laser energy.

In other NIF news, Christoph Niemann, who holds the NIF Professorship in High Energy Density Science at UCLA, has been awarded the DOE Plasma Physics Junior Faculty Award to fund his research on K-alpha sources for three years. In addition, two of Niemann's papers have recently been accepted for publication in *Applied Physics Letters*.

Photo of the week



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